SGS

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd

FCC SAR TEST REPORT

Application No.:	SUCR2411000484AT
Applicant:	Vanstone Electronic (Beijing) Co., Ltd.
Manufacturer:	Vanstone Electronic (Beijing) Co., Ltd.
Product Name:	SoundBox
Model No. (EUT):	Q181 Mini
Trade Mark:	Aisino
FCC ID:	OWLQ181-MINI
Standards:	FCC 47CFR §2.1093
Date of Receipt:	**2024-11-13**
Date of Test:	2024-11-14 to 2024-11-19
Date of Issue:	2024-11-26
Test conclusion:	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Prepared by：Leon Liu/ Project Manager

Approved by：Nick HU/ Technical Manager (Title)

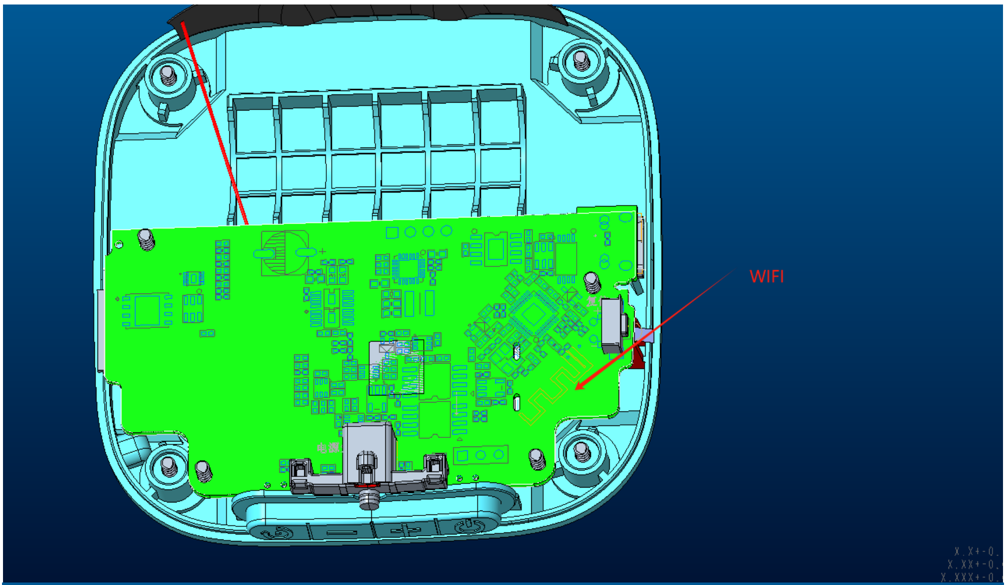
Revision Record			
Version	**Description**	**Date**	**Remark**
01	Original	2024-11-19	

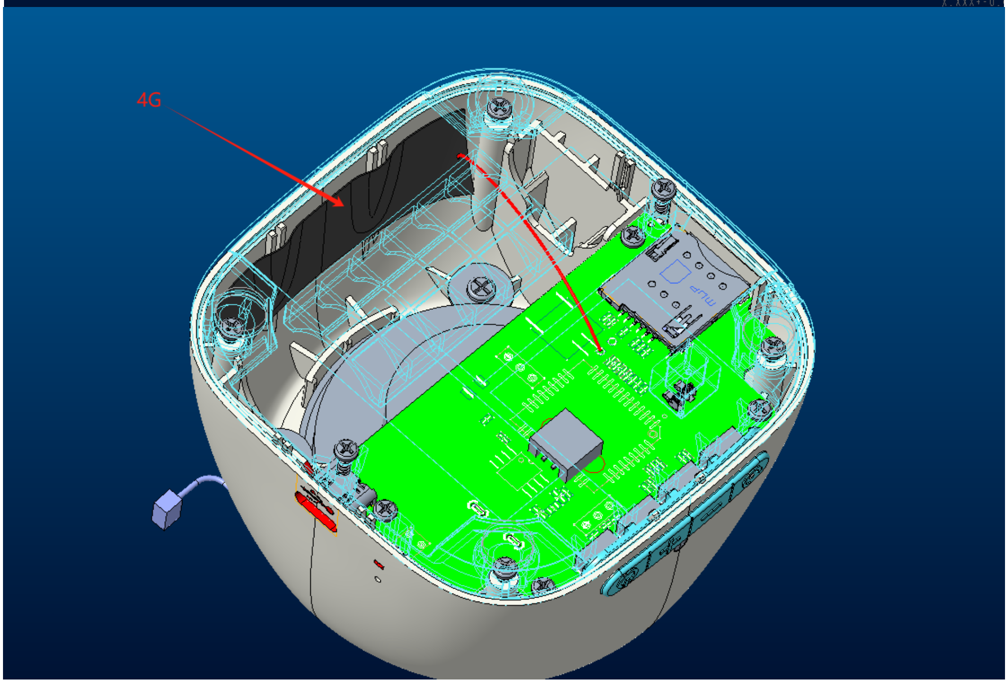
TEST SUMMARY

Frequency Band	Maximum Reported SAR(W/kg)
	Extremity 0mm 10g SAR
LTE Band 2	2.78
LTE Band 4	1.86
LTE Band 5	0.19
LTE Band 7	3.79
LTE Band 66	1.86
WI-FI (2.4GHz)	<0.10
SAR Limited(W/kg)	4.0
Maximum Simultaneous Transmission SAR (W/kg)	
Scenario	Extremity 0mm 10g SAR
Sum SAR	3.79
SPLSR	/
SPLSR Limited	0.1

Note: According to TCB workshop April, 2015 RF Exposure Procedures Update (Overlapping LTE Bands), SAR for LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to similar frequency range, same maximum tune up limit and same channel bandwidth.
Remark: this device may be equipped with or without amount display, SAR test was performed without the amount display, due to there's no impact on SAR test.

1 DUT Antenna Locations (Back View)





2 General Information

2.1 Details of Client

Applicant:	Vanstone Electronic (Beijing) Co., Ltd.
Address:	3F No.2 Building, Aisino Corporation Park 18A, Xingshikou Road, Haidian District, Beijing, China 100195
Manufacturer:	Vanstone Electronic (Beijing) Co., Ltd.
Address:	3F No.2 Building, Aisino Corporation Park 18A, Xingshikou Road, Haidian District, Beijing, China 100195

2.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test Engineer:	Koller Chen

2.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

- **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

2.4 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Name:	SoundBox		
Model No.(EUT):	Q181 Mini		
FCC ID:	OWLQ181-MINI		
Trade Mark:	N/A		
Product Phase:	production unit		
IMEI:	868228075084460		
Hardware Version:	V1.00		
Software Version:	V1.00		
Device Operating Configurations :			
Modulation Mode:	**LTE:** QPSK,16QAM; **WIFI:** DSSS, OFDM;		
Device Class:	B		
Power Class	3, tested with power control Max Power(LTE Band)		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	LTE Band 2	1850~1910	1930~1990
	LTE Band 4	1710-1755	2110-2155
	LTE Band 5	824~849	869-894
	LTE Band 7	2500 ~ 2570	2620 ~ 2690
	LTE Band 66	1710~1780	2110~2200
	Wi-Fi 2.4G	2402~2462	2402~2462
RF Cable:	☒ Provided by the aplicant ☐ Provided by the laboratory		
1# Battery Information:	Model:	18650 2000mAh	
	Normal Voltage:	DC3.7V	
	Typical capacity:	2000mAh	
	Manufacturer:	MEI ZHOU BO FU NENG TECHNOLOGY CO.,LTD	

Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

Remark:
As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

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2.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB 248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r02
KDB 447498 D01	General RF Exposure Guidance v06
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 690783 D01	SAR Listings on Grants v01r03

2.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	1.60 mW/g	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	**4.00 mW/g**	20.00 mW/g

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)

3 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

Table 1：The Ambient Conditions

4 SAR Measurements System Configuration

4.1 The SAR Measurement System

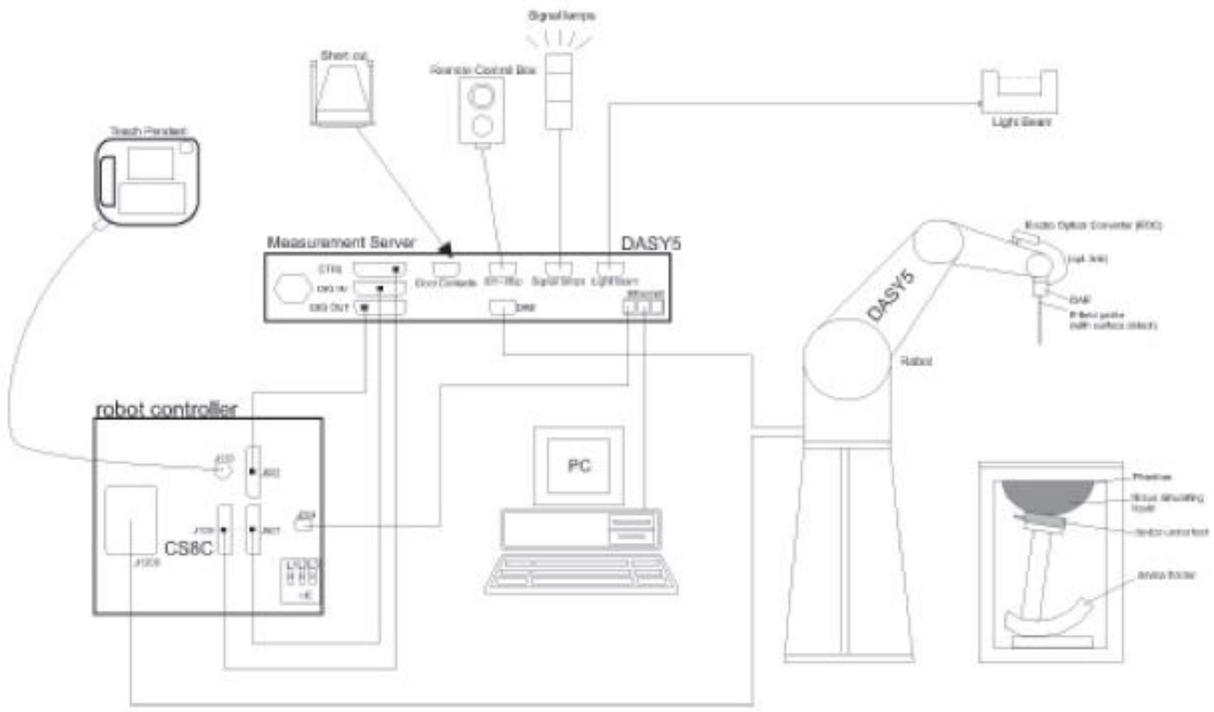
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

The DASY5 system for performing compliance tests consists of the following items:
A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



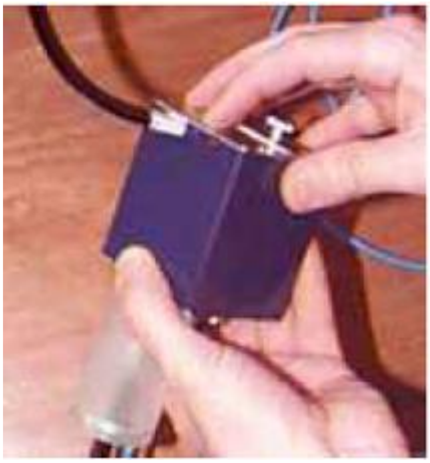
F-1. SAR Measurement System Configuration

- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

4.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

4.3 Data Acquisition Electronics (DAE)

Model	DAE	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)	
Input Offset Voltage	< 5μV (with auto zero)	
Input Bias Current	< 50 f A	
Dimensions	60 x 60 x 68 mm	

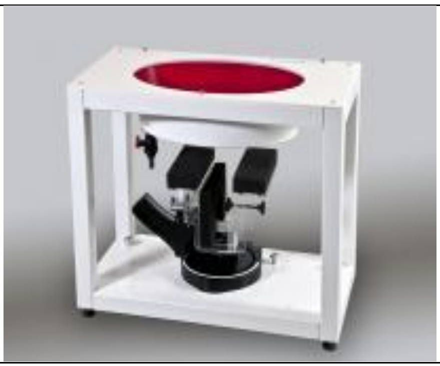
4.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	
Wooden Support	SPEAG standard phantom table	

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

4.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

The ELI phantom is used for compliance testing of handheld and body-mounted wireless devices in the frequency range of 4 MHz to 10 GHz. ELI is fully compatible with the IEC/IEEE 62209-1528 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all of SPEAG's dosimetric probes and dipoles.

ELI V5.0 and higher has the same shell geometry and is manufactured from the same material as ELI V4.0 but has a reinforced top structure.

4.6 Device Holder for Transmitters

F-2. **Device Holder for Transmitters**

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

4.7 Measurement procedure

4.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: *Area scan*

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: *Zoom scan*

Around this point, a volume of 32mm*32mm*30mm (f≤2GHz), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points (f≤2GHz), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification).The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
</table>

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %

4.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

4.7.3 Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters: - Sensitivity Normi, ai0, ai1, ai2
- Conversion factor ConvFi
- Diode compression point Dcpi
Device parameters: - Frequency f
- Crest factor cf
Media parameters: - Conductivity ε
- Density ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp i = diode compression point (DASY parameter)
From the compensated input signals the primary field data for each channel can be evaluated:
E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel I (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ= conductivity in [mho/m] or [Siemens/m]
ε= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m

5 SAR measurement variability and uncertainty

5.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

5.2 SAR measurement uncertainty

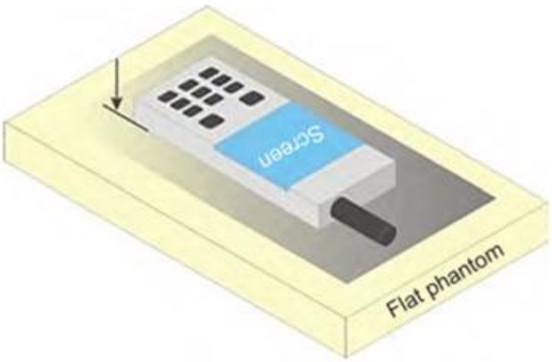
Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

6 Description of Test Position

6.1 Exposure Condition

6.1.1 Hand-held usage of the device, not at the head or torso

Per the manufacturer's assertion, the device is intended for handheld utilization. When SAR measurement is necessary for hand-held devices that do not transmit while at the head or torso, a flat phantom may be used. To assess this type of device, the device shall be placed directly against the flat phantom as shown in Figure 1, for the sides of the device that are in contact with the hand for the intended use, and the test distance is adopted as 0mm for the testing.



F-1. **Test position for hand-held devices.**

7 SAR System Verification Procedure

7.1 Tissue Simulate Liquid

7.1.1 Recipes for Tissue Simulate Liquid

The bellowing tables give the recipes for tissue simulating liquids to be used in different frequency bands：

Ingredients (% by weight)	Frequency (MHz)				
	450	700-900	1750-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99^{+}% Pure Sodium Chloride Water: De-ionized, 16 MΩ^{+} resistivity Tween: Polyoxyethylene (20) sorbitan monolaurate			Sucrose: 98^{+}% Pure Sucrose HEC: Hydroxyethyl Cellulose		
HSL13MHz is composed of the following ingredients： Water：50-90% Non-ionic detergents：5-50% Nacl：0-2% Preservative：0.03-0.1% HSL5GHz is composed of the following ingredients： Water：50-65% Mineral oil：10-30% Emulsifiers：8-25% Sodium salt：0-1.5%					

Table 2：Recipe of Tissue Simulate Liquid

7.1.2 Measurement for Tissue Simulate Liquid

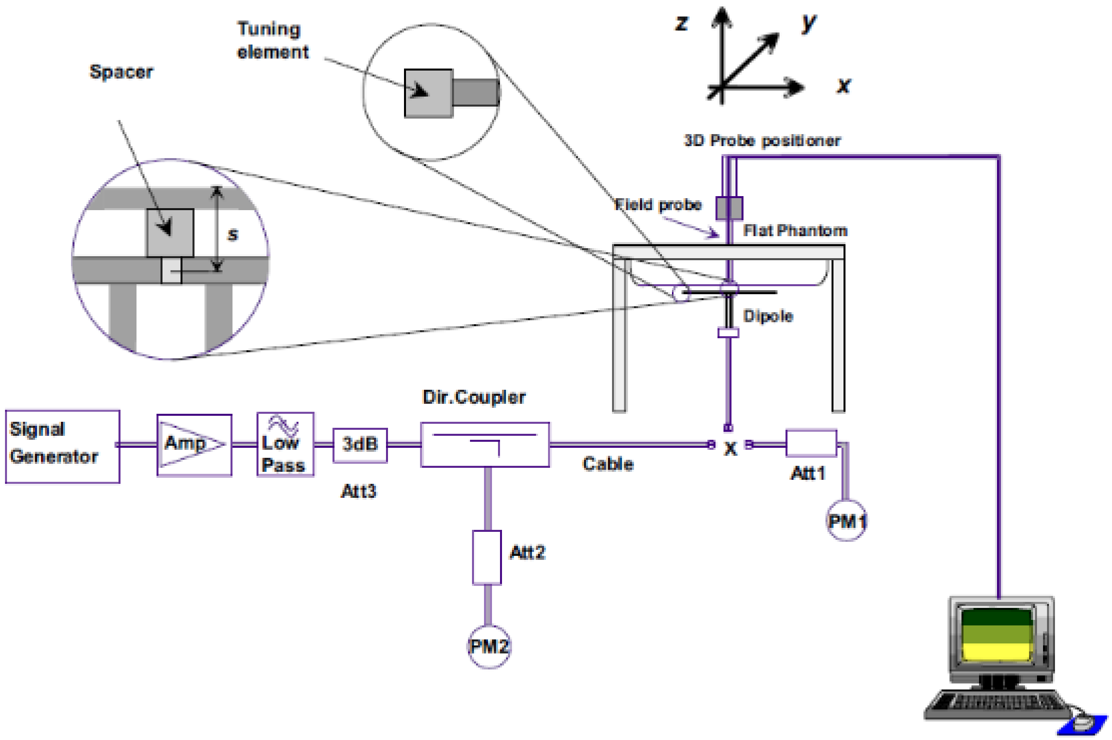
The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Measurement for Tissue Simulate Liquid							
Tissue Type	Measured Frequency （MHz）	Target Tissue (±5%)		Measured Tissue		Liquid Temp.	Test Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	(℃)	
835 Head	835	41.5 (39.43~43.58)	0.90 (0.86~0.95)	41.062	0.901	22.2	2024/11/14
1750 Head	1750	40.1 (38.10~42.11)	1.37 (1.30~1.44)	40.213	1.312	21.9	2024/11/15
1950 Head	1900	40.0 (38.00~42.00)	1.40 (1.33~1.47)	40.507	1.417	22.3	2024/11/16
2450 Head	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	37.999	1.772	22.2	2024/11/18
2600 Head	2600	39.0 (37.05~40.95)	1.96 (1.86~2.06)	38.547	1.997	22.3	2024/11/19

Table 3： Measurement result of Tissue electric parameters.

7.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-1. the microwave circuit arrangement used for SAR system check

7.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.
a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated value;
c) Return-loss is within 10% of calibrated measurement;
d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

7.2.2 Summary System Check Result(s)

SAR System Validation Result(s)											
Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within ±10%)		Liquid Temp. (℃)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D835V2	Head	2.26	1.48	9.04	5.92	9.60	6.16	-5.83%	-3.90%	22.2	2024/11/14
D1750V2	Head	8.61	4.58	34.44	18.32	37.00	19.30	-6.92%	-5.08%	21.9	2024/11/15
D1950V3	Head	10.20	5.24	40.80	20.96	40.40	20.80	0.99%	0.77%	22.3	2024/11/16
D2450V2	Head	12.70	5.88	50.80	23.52	52.70	24.60	-3.61%	-4.39%	22.2	2024/11/18
D2600V2	Head	13.90	6.21	55.60	24.84	57.30	25.40	-2.97%	-2.20%	22.3	2024/11/19

Table 4： SAR System Check Result.

7.2.3 Detailed System Check Results

Please see the Appendix A

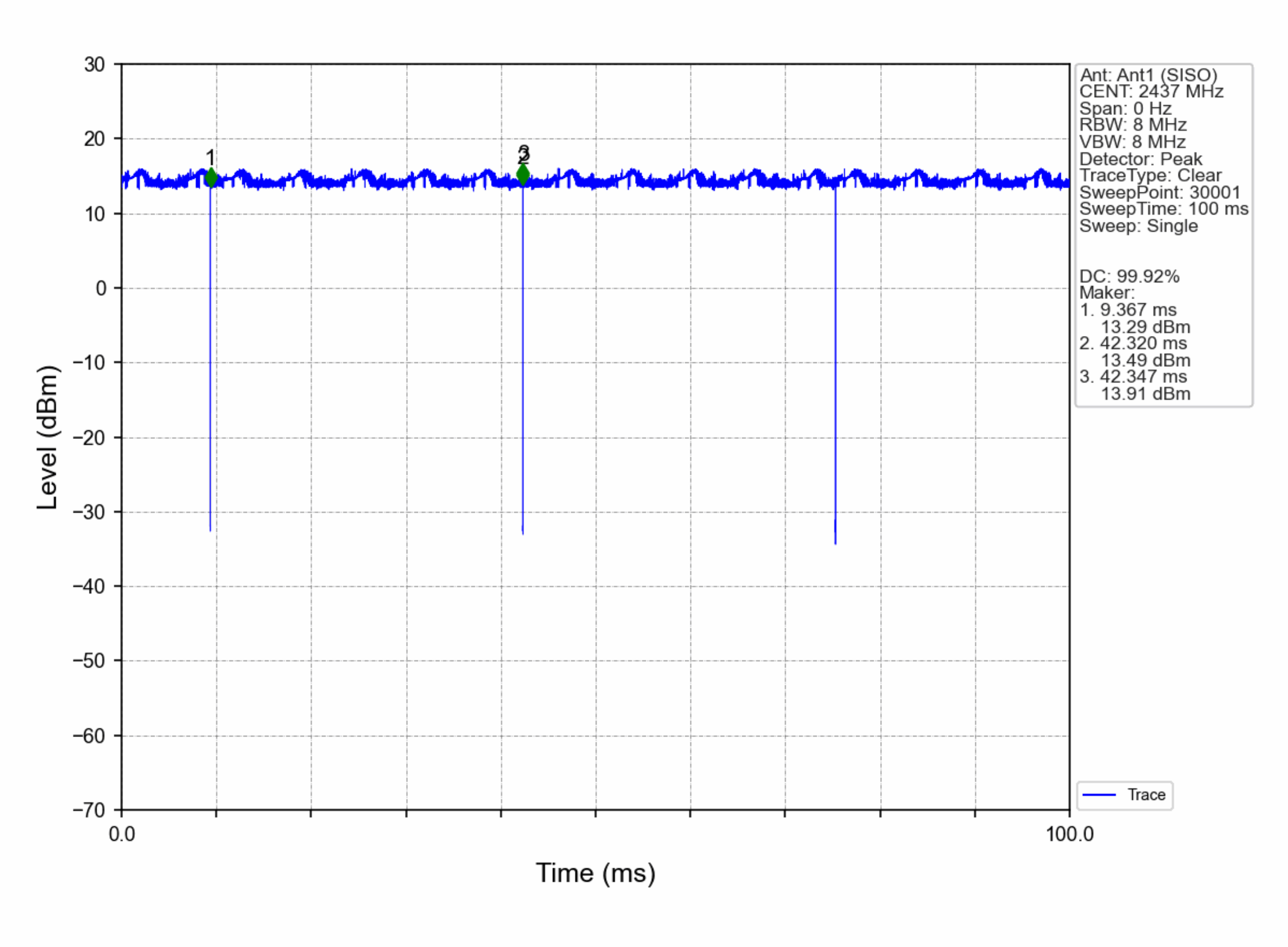
8 Test Configuration

8.1 WiFi Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

8.1.1.1 Duty cycle

Wi-Fi 2.4GHz 802.11b:
Duty cycle=99.92%



8.1.1.2 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

1）. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).

2）. When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.

3）. For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

8.1.1.3 Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required. SAR test reduction for subsequent highest output test channels is determined according to *reported* SAR of the initial test configuration.
For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.
When the *reported* SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

8.1.1.4 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

1）. When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.

2）. When the highest *reported* SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

3）. The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.

   a) SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.
   b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the *reported* SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.

4）. SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by recursively applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:

   a) replace “subsequent test configuration” with “next subsequent test configuration” (i.e., subsequent next highest specified maximum output power configuration)
   b) replace “initial test configuration” with “all tested higher output power configurations”

8.1.1.5 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1）. When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2）. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

1）. When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.

2）. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

8.1.1 LTE Test Configuration

LTE modes were tested according to FCC KDB 941225 D05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The Anritsu MT8820C was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

A) Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

B) MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

C) A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

D) Largest channel bandwidth standalone SAR test requirements

1) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

2) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 1) are applied to measure the SAR for QPSK with 50% RB allocation.

3) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 1) and 2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the

QPSK configuration is > 1.45 W/kg.

E) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

9 Test Result

9.1 Measurement of RF conducted Power.

1）. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:
Frame-averaged power = 10 x log (Burst-averaged power mW x Slot used / 8

2）. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

3）. For conducted power of WIFI must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band. For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured. Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.

1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.
2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.

9.1.1 Conducted Power of LTE

LTE Band 2				**Conducted Power(dBm)**			Tune up
Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193	
1.4MHz	QPSK	1	0	23.52	23.38	23.14	24
		1	2	23.64	23.38	22.51	24
		1	5	23.65	23.31	22.29	24
		3	0	23.65	23.31	22.37	24
		3	2	23.6	23.32	22.3	24
		3	3	23.65	23.3	22.13	24
		6	0	22.55	22.33	21.26	23
	16QAM	1	0	22.75	22.42	21.47	23
		1	2	22.7	22.36	21.42	23
		1	5	22.67	22.37	21.24	23
		3	0	22.56	22.43	21.24	23
		3	2	22.52	22.4	21.18	23
		3	3	22.49	22.38	21.1	23
		6	0	21.68	21.41	20.34	22
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185	Tune up
3MHz	QPSK	1	0	23.44	23.21	23.02	24
		1	7	23.84	23.25	22.12	24
		1	14	23.49	23.11	22.17	24
		8	0	22.6	22.27	21.23	23
		8	4	22.54	22.27	21.07	23
		8	7	22.42	22.26	21.12	23
		15	0	22.41	22.23	21.05	23
	16QAM	1	0	22.53	22.84	21.46	23
		1	7	22.49	22.8	21.24	23
		1	14	22.23	22.7	21.18	23
		8	0	21.58	21.52	20.31	22
		8	4	21.57	21.58	20.21	22
		8	7	21.54	21.52	20.05	22
		15	0	21.52	21.48	20.2	22
Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175	Tune up
5MHz	QPSK	1	0	23.45	23.03	22.73	24
		1	13	23.2	22.94	22.05	24
		1	24	22.92	22.82	22.11	24
		12	0	22	21.9	21.34	23
		12	6	22.02	21.94	21.15	23
		12	13	21.81	21.77	21.13	23
		25	0	21.86	21.85	21.04	23
	16QAM	1	0	22.01	22.24	21.77	23
		1	13	21.86	22.23	21.22	23
		1	24	21.77	22.1	21.13	23
		12	0	21.07	21.12	20.48	22
		12	6	21.13	21.18	20.33	22
		12	13	20.9	21.07	20.13	22

		25	0	20.99	21.06	20.28	22
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18650	18900	19150	
10MHz	QPSK	1	0	23.07	22.95	23.06	24
		1	25	22.74	22.79	22.63	24
		1	49	22.75	22.57	22.48	24
		25	0	21.57	21.65	21.62	23
		25	13	21.66	21.79	21.56	23
		25	25	21.54	21.63	21.92	23
		50	0	21.53	21.64	21.35	23
	16QAM	1	0	22.56	22.12	22.02	23
		1	25	22.28	22.05	21.67	23
		1	49	22.42	21.83	21.45	23
		12	0	21.9	21.9	21.9	22
		12	19	21.74	21.91	21.72	22
		12	38	21.75	21.66	20.86	22
		27	0	20.63	20.93	20.24	22
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18675	18900	19125	
15MHz	QPSK	1	0	23.51	23.44	23.36	24
		1	38	23.18	23.36	23.38	24
		1	74	23.15	23.11	22.08	24
		36	0	21.86	22.34	22.31	23
		36	18	21.91	22.39	22.31	23
		36	39	21.99	22.05	21.82	23
		75	0	21.95	22.12	21.88	23
	16QAM	1	0	22.39	22.56	22.27	23
		1	38	22.29	22.57	22.38	23
		1	74	22.43	22.3	21.02	23
		12	0	21.76	21.94	22	22
		12	31	21.83	21.98	21.94	22
		12	63	21.79	21.62	20.94	22
		27	0	20.81	21.27	20.61	22
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18700	18900	19100	
20MHz	QPSK	1	0	23.42	23.58	23.45	24
		1	50	23.4	23.46	23.41	24
		1	99	23.08	23.13	22.06	24
		50	0	22.12	22.28	22.09	23
		50	25	22.37	22.35	22.23	23
		50	50	22.2	21.98	22.05	23
		100	0	22.18	22.23	22.09	23
	16QAM	1	0	22.75	22.68	22.5	23
		1	50	22.7	22.8	22.82	23
		1	99	22.53	22.43	21.34	23
		12	0	21.95	21.95	21.73	22
		12	44	21.97	21.93	21.96	22
		12	88	21.91	21.64	20.8	22
		27	0	20.86	21.14	20.44	22

LTE Band 4				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393	Tune up
1.4MHz	QPSK	1	0	22.71	23.58	23.94	24
		1	2	23.33	23.44	23.84	24
		1	5	23.74	23.76	23.86	24
		3	0	23.89	23.44	23.79	24
		3	2	23.84	23.42	23.79	24
		3	3	23.71	23.34	23.82	24
		6	0	22.89	22.46	22.88	23
	16QAM	1	0	22.68	22.54	22.73	23
		1	2	22.71	22.51	22.84	23
		1	5	22.86	22.49	22.71	23
		3	0	22.59	22.61	22.85	23
		3	2	22.65	22.64	22.91	23
		3	3	22.64	22.62	22.64	23
		6	0	21.41	21.62	21.91	22
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385	Tune up
3MHz	QPSK	1	0	22.92	22.98	23.39	24
		1	7	23.25	22.94	23.45	24
		1	14	23.3	22.75	23.38	24
		8	0	22.02	22.05	22.52	23
		8	4	22.31	21.99	22.48	23
		8	7	22.37	21.96	22.5	23
		15	0	22.24	21.94	22.45	23
	16QAM	1	0	22.55	22.06	22.48	23
		1	7	22.74	22.11	22.63	23
		1	14	22.69	21.99	22.55	23
		8	0	21.34	21.06	21.69	22
		8	4	21.59	21.11	21.71	22
		8	7	21.69	21.09	21.73	22
		15	0	21.43	21.11	21.69	22
Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375	Tune up
5MHz	QPSK	1	0	23.09	22.92	23.07	24
		1	13	23.47	22.76	23.29	24
		1	24	23.56	22.67	23.18	24
		12	0	22.08	21.87	22.11	23
		12	6	22.3	21.76	22.27	23
		12	13	22.39	21.67	22.28	23

		25	0	22.21	21.68	22.22	23
	16QAM	1	0	21.68	22.12	22.2	23
		1	13	22.32	22.01	22.45	23
		1	24	22.46	22.16	22.42	23
		12	0	21.14	20.85	21.26	22
		12	6	21.48	20.96	21.44	22
		12	13	21.59	20.88	21.46	22
		25	0	21.36	20.87	21.44	22
Bandwidth	Modulation	RB size	RB offset	Channel 20000	Channel 20175	Channel 20350	Tune up
10MHz	QPSK	1	0	22.63	22.75	22.79	24
		1	25	23.42	22.6	22.84	24
		1	49	23.37	22.68	22.91	24
		25	0	21.97	21.65	21.65	23
		25	13	22.41	21.54	21.88	23
		25	25	22.37	21.51	21.89	23
		50	0	22.21	21.55	21.77	23
	16QAM	1	0	22.18	21.82	21.85	23
		1	25	22.75	21.69	21.95	23
		1	49	22.64	21.62	22.11	23
		12	0	21.94	21.63	21.86	22
		12	19	21.63	21.56	21.84	22
		12	38	21.79	21.49	21.77	22
		27	0	21.12	20.62	21.11	22
Bandwidth	Modulation	RB size	RB offset	Channel 20025	Channel 20175	Channel 20325	Tune up
15MHz	QPSK	1	0	23.23	23.55	23.45	24
		1	38	23.77	23.84	23.47	24
		1	74	23.48	22.97	23.38	24
		36	0	22.52	21.99	22.12	23
		36	18	22.8	21.9	22.29	23
		36	39	22.68	21.83	22.31	23
		75	0	22.52	21.75	22.15	23
	16QAM	1	0	22.24	22.32	22.36	23
		1	38	23.16	22.13	22.54	23
		1	74	22.66	22.25	22.64	23
		12	0	21.93	21.64	21.73	22
		12	31	21.79	21.66	21.94	22
		12	63	21.72	21.55	21.88	22
		27	0	21.32	20.78	21.27	22
Bandwidth	Modulation	RB size	RB offset	Channel 20050	Channel 20175	Channel 20300	Tune up

20MHz	QPSK	1	0	23.13	23.64	23.12	24
		1	50	23.45	23.07	23.34	24
		1	99	22.96	22.92	23.28	24
		50	0	22.49	21.89	21.93	23
		50	25	22.75	21.82	22.11	23
		50	50	22.21	21.73	22.1	23
		100	0	22.34	21.68	21.94	23
	16QAM	1	0	22.01	22.63	22.05	23
		1	50	22.95	22.29	22.63	23
		1	99	22.12	22.31	22.62	23
		12	0	21.93	21.81	21.4	22
		12	44	21.81	21.73	21.84	22
		12	88	21.77	21.57	21.97	22
		27	0	21.09	20.79	21.06	22

LTE Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643	Tune up
1.4MHz	QPSK	1	0	21.78	22.23	21.57	22.5
		1	2	21.77	22.1	21.49	22.5
		1	5	22.15	22.23	21.51	22.5
		3	0	21.91	22.2	21.51	22.5
		3	2	21.92	22.08	21.49	22.5
		3	3	21.85	21.99	21.51	22.5
		6	0	20.94	21.19	20.62	21.5
	16QAM	1	0	20.85	21.1	20.67	21.5
		1	2	20.59	21.28	20.67	21.5
		1	5	20.87	21.35	20.61	21.5
		3	0	20.89	21.21	20.72	21.5
		3	2	21.09	21.19	20.59	21.5
		3	3	21.13	21.17	20.69	21.5
		6	0	19.83	20.22	19.54	20.5
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635	Tune up
3MHz	QPSK	1	0	21.26	21.8	21.4	22.5
		1	7	21.21	21.78	21.47	22.5
		1	14	21.41	21.66	21.3	22.5
		8	0	20.39	20.92	20.55	21.5
		8	4	20.46	20.95	20.56	21.5
		8	7	20.49	20.76	20.59	21.5
		15	0	20.42	20.92	20.55	21.5
	16QAM	1	0	20.93	20.94	20.57	21.5
		1	7	21.07	21.16	20.74	21.5
		1	14	20.99	20.91	20.61	21.5
		8	0	19.61	20.1	19.8	20.5
		8	4	19.66	19.82	19.79	20.5
		8	7	19.81	20.03	19.74	20.5
		15	0	19.61	19.99	19.76	20.5
Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625	Tune up
5MHz	QPSK	1	0	21.48	22.08	21.81	22.5
		1	13	21.66	21.87	21.46	22.5
		1	24	21.87	21.79	21.5	22.5
		12	0	20.35	20.86	20.44	21.5
		12	6	20.62	20.9	20.31	21.5
		12	13	20.68	20.75	20.24	21.5

		25	0	20.52	20.84	20.42	21.5
	16QAM	1	0	20.36	21.31	20.78	21.5
		1	13	20.58	21.22	20.62	21.5
		1	24	20.68	21.1	20.66	21.5
		12	0	19.6	19.94	19.52	20.5
		12	6	19.67	20.13	19.58	20.5
		12	13	19.83	19.99	19.54	20.5
		25	0	19.72	20	19.61	20.5
Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600	Tune up
10MHz	QPSK	1	0	22.01	22.08	22.05	22.5
		1	25	21.73	21.85	21.74	22.5
		1	49	21.63	21.69	21.69	22.5
		25	0	20.74	20.82	20.62	21.5
		25	13	20.57	20.65	20.31	21.5
		25	25	20.56	20.4	20.17	21.5
		50	0	20.42	20.47	20.17	21.5
	16QAM	1	0	20.31	21.34	20.59	21.5
		1	25	20.68	21.35	20.58	21.5
		1	49	20.73	21.04	20.4	21.5
		12	0	20.43	20.48	20.44	20.5
		12	19	20.38	20.42	20.49	20.5
		12	38	20.48	20.32	20.36	20.5
		27	0	19.32	19.77	19.4	20.5

LTE Band 7				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 20775	Channel 21100	Channel 21425	Tune up
5MHz	QPSK	1	0	23.25	23.27	22.47	24
		1	13	23.21	22.95	22.07	24
		1	24	23.1	22.85	22.1	24
		12	0	22.21	22.02	21.19	23
		12	6	22.18	22.06	21.16	23
		12	13	22.12	22.05	21.28	23
		25	0	22.09	22.01	21.08	23
	16QAM	1	0	22.19	22.33	21.53	23
		1	13	22.08	22.36	21.26	23
		1	24	22.08	22.35	21.06	23
		12	0	21.39	21.31	214	23
		12	6	21.38	21.38	21.42	23
		12	13	21.35	21.4	21.28	23
		25	0	21.37	21.33	20.44	22
Bandwidth	Modulation	RB size	RB offset	Channel 20800	Channel 21100	Channel 21400	Tune up
10MHz	QPSK	1	0	23.18	23.66	22.46	24
		1	25	23.13	22.81	22.22	24
		1	49	23.19	22.68	22.19	24
		25	0	22.09	21.87	21.16	23
		25	13	22.18	21.94	21.27	23
		25	25	22.11	21.85	21.15	23
		50	0	21.99	21.82	21.15	23
	16QAM	1	0	22.39	22.26	21.52	23
		1	25	22.37	22.18	21.35	23
		1	49	22.32	22.12	21.16	23
		12	0	22.18	22.16	21.48	23
		12	19	22.11	22.02	21.38	23
		12	38	22.21	21.97	21.1	23
		27	0	21.1	21.2	20.26	22
Bandwidth	Modulation	RB size	RB offset	Channel 20825	Channel 21100	Channel 21375	Tune up
15MHz	QPSK	1	0	23.32	23.57	23.48	24
		1	38	23.21	23.17	23.02	24
		1	74	23.46	23.1	22.38	24
		36	0	22.32	22.55	22.08	23
		36	18	22.36	22.48	22.02	23
		36	39	22.35	22.33	21.73	23

		75	0	22.22	22.28	21.81	23
	16QAM	1	0	22.46	22.4	22.46	23
		1	38	22.43	22.46	22.26	23
		1	74	22.41	22.39	21.75	23
		12	0	22.13	22.18	21.97	23
		12	31	22.25	22.18	21.93	23
		12	63	22.2	21.98	21.38	23
		27	0	21.31	21.45	20.95	22
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20850	21100	21350	
20MHz	QPSK	1	0	23.77	23.84	23.82	24
		1	50	23.69	23.58	23.64	24
		1	99	23.73	23.63	23.39	24
		50	0	22.77	22.78	22.69	23
		50	25	22.37	22.41	21.99	23
		50	50	22.33	22.19	21.75	23
		100	0	22.21	22.22	21.78	23
	16QAM	1	0	22.47	22.7	22.55	23
		1	50	22.7	22.65	22.65	23
		1	99	22.6	22.33	21.89	23
		12	0	22.28	22.47	21.95	23
		12	44	22.57	22.48	22.15	23
		12	88	22.4	22.13	21.49	23
		27	0	21.33	21.5	20.83	22

LTE Band 66				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel 131979	Channel 132322	Channel 132665	Tune up
1.4MHz	QPSK	1	0	23.11	23.13	22.3	24.00
		1	2	23.04	22.93	22.28	24.00
		1	5	23.14	23.03	22.28	24.00
		3	0	22.86	22.97	22.24	24.00
		3	1	22.91	22.92	22.24	24.00
		3	3	22.99	22.89	22.23	24.00
		6	0	22.07	21.99	21.36	23.00
	16QAM	1	0	22.09	22.19	21.31	23.00
		1	2	22.2	22.26	21.35	23.00
		1	5	22.31	22.22	21.29	23.00
		3	0	21.85	21.91	21.27	22.00
		3	1	21.94	21.91	21.25	22.00
		3	3	22	21.91	21.23	22.00
		6	0	21.03	21.15	20.53	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 131987	Channel 132322	Channel 132657	Tune up
3MHz	QPSK	1	0	23.01	23.02	22.24	24.00
		1	7	23.3	23.09	22.29	24.00
		1	14	23.33	22.98	22.11	24.00
		8	0	22.13	21.97	21.34	23.00
		8	4	22.37	22.05	21.38	23.00
		8	7	22.38	22.02	21.35	23.00
		15	0	22.19	21.94	21.36	23.00
	16QAM	1	0	22.02	21.8	21.52	23.00
		1	7	22.37	21.88	21.54	23.00
		1	14	22.41	21.83	21.39	23.00
		8	0	21.18	21.12	20.55	22.00
		8	4	21.38	21.13	20.51	22.00
		8	7	21.45	21.13	20.52	22.00
		15	0	21.26	21.01	20.44	22.00
Bandwidth	Modulation	RB size	RB offset	Channel 131997	Channel 132322	Channel 132647	Tune up
5MHz	QPSK	1	0	22.76	22.91	21.95	24.00
		1	13	23.16	22.83	22.13	24.00
		1	24	23.24	22.75	21.83	24.00
		12	0	21.86	21.67	21.17	23.00
		12	6	22.12	21.74	21.25	23.00
		12	13	22.2	21.73	21.16	23.00

		25	0	22.02	21.65	21.2	23.00
	16QAM	1	0	21.71	21.85	21.53	23.00
		1	13	22.25	21.92	21.51	23.00
		1	24	22.37	21.88	21.39	23.00
		12	0	20.93	20.83	20.36	22.00
		12	6	21.22	20.92	20.46	22.00
		12	13	21.31	20.92	20.37	22.00
		25	0	21.15	20.88	20.33	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132022	132322	132622	
10MHz	QPSK	1	0	22.6	22.75	22.08	24.00
		1	25	23.14	22.65	22.07	24.00
		1	49	23.09	22.67	21.68	24.00
		25	0	21.83	21.4	21.15	23.00
		25	13	22.21	21.61	21.21	23.00
		25	25	22.15	21.58	21.05	23.00
		50	0	21.98	21.43	21.14	23.00
	16QAM	1	0	21.69	21.39	21.58	23.00
		1	25	22.45	21.58	21.48	23.00
		1	49	22.29	21.57	21.25	23.00
		12	0	21.75	21.52	21.55	23.00
		12	19	22.3	21.62	21.36	23.00
		12	38	22.19	21.59	21.24	23.00
		27	0	20.99	20.66	20.23	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132047	132322	132597	
15MHz	QPSK	1	0	23.2	23.4	23.28	24.00
		1	38	23.83	23.43	23.24	24.00
		1	74	23.46	23.37	22.61	24.00
		36	0	22.55	22.26	22.13	23.00
		36	18	22.81	22.32	22.16	23.00
		36	39	22.61	22.37	21.91	23.00
		75	0	22.5	22.19	21.9	23.00
	16QAM	1	0	22.23	22.28	22.39	23.00
		1	38	22.95	22.5	22.31	23.00
		1	74	22.53	22.5	21.94	23.00
		12	0	22.11	21.89	21.9	23.00
		12	31	22.74	22.22	22.07	23.00
		12	63	22.26	22.19	21.59	23.00
		27	0	21.36	21.06	20.76	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132072	132322	132572	

20MHz	QPSK	1	0	23.34	23.47	23.34	24.00
		1	50	23.94	23.69	23.35	24.00
		1	99	23.5	23.48	22.62	24.00
		50	0	22.87	22.62	22.57	23.00
		50	25	23.06	22.47	22.28	23.00
		50	50	22.66	22.49	22.03	23.00
		100	0	22.62	22.23	22.07	23.00
	16QAM	1	0	22.18	22.02	22.35	23.00
		1	50	23.1	22.59	22.29	23.00
		1	99	22.42	22.4	21.78	23.00
		12	0	22.17	21.68	22.15	23.00
		12	44	22.92	22.39	22.17	23.00
		12	88	22.11	22.2	21.54	23.00
		27	0	21.47	20.95	20.68	22.00

9.1.2 Conducted Power of WIFI

WIFI 2.4G					
Mode	Channel	Frequency (MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up
				Main Ant	
802.11b	1	2412	1	10.32	11
	6	2437		10.69	11
	11	2462		10.57	11
802.11g	1	2412	6	9.33	10
	6	2437		9.81	10
	11	2462		9.3	10
802.11n HT20 SISO	1	2412	6.5	9.23	10
	6	2437		9.67	10
	11	2462		9.28	10

9.2 Measurement of SAR Data

Note:

1) Graph results refer to Appendix B.
2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.
3) Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

WiFi 2.4G:

1) When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.

9.2.1 SAR Result of LTE Band 2

LTE Band 2 SAR Test Record											
Main Ant.											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Extremity Test data(Separate 0mm 1RB)											
Front side	20	QPSK 1_0	18900/1880	1:1	0.152	0.01	23.58	24.00	1.102	0.167	22.3
Back side	20	QPSK 1_0	18900/1880	1:1	0.627	-0.12	23.58	24.00	1.102	0.691	22.3
Left side	20	QPSK 1_0	18900/1880	1:1	0.262	0.16	23.58	24.00	1.102	0.289	22.3
Right side	20	QPSK 1_0	18900/1880	1:1	0.175	-0.09	23.58	24.00	1.102	0.193	22.3
Top side	20	QPSK 1_0	18900/1880	1:1	1.930	-0.16	23.58	24.00	1.102	2.126	22.3
Bottom side	20	QPSK 1_0	18900/1880	1:1	0.224	0.17	23.58	24.00	1.102	0.247	22.3
Top side	20	QPSK 1_0	18700/1860	1:1	2.180	0.02	23.42	24.00	1.143	2.491	22.3
Top side	20	QPSK 1_0	19100/1900	1:1	2.450	-0.15	23.45	24.00	1.135	2.781	22.3
Extremity Test data(Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	18900/1880	1:1	0.145	-0.17	22.28	23.00	1.180	0.171	22.3
Back side	20	QPSK 50_0	18900/1880	1:1	0.608	-0.15	22.28	23.00	1.180	0.718	22.3
Left side	20	QPSK 50_0	18900/1880	1:1	0.254	-0.11	22.28	23.00	1.180	0.300	22.3
Right side	20	QPSK 50_0	18900/1880	1:1	0.164	0.19	22.28	23.00	1.180	0.194	22.3
Top side	20	QPSK 50_0	18900/1880	1:1	1.874	-0.11	22.28	23.00	1.180	2.212	22.3
Bottom side	20	QPSK 50_0	18900/1880	1:1	0.196	-0.07	22.28	23.00	1.180	0.231	22.3
Top side	20	QPSK 50_0	18700/1860	1:1	2.020	0.03	22.12	23.00	1.225	2.474	22.3
Top side	20	QPSK 50_0	19100/1900	1:1	2.130	0.01	22.09	23.00	1.233	2.627	22.3
Extremity Test data(Separate 0mm 100%RB)											
Top side	20	QPSK 100_0	19100/1900	1:1	1.560	0.04	22.23	23.00	1.194	1.863	22.3

Table 5: SAR of LTE Band 2 for Extremity.

9.2.2 SAR Result of LTE Band 5

LTE Band 5 SAR Test Record											
Main Ant.											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Extremity Test data(Separate 0mm 1RB)											
Front side	10	QPSK 1_0	20525/836.5	1:1	0.001	0.03	22.08	22.50	1.102	0.001	22.2
Back side	10	QPSK 1_0	20525/836.5	1:1	0.175	-0.04	22.08	22.50	1.102	0.193	22.2
Left side	10	QPSK 1_0	20525/836.5	1:1	0.129	0.18	22.08	22.50	1.102	0.142	22.2
Right side	10	QPSK 1_0	20525/836.5	1:1	0.165	-0.07	22.08	22.50	1.102	0.182	22.2
Top side	10	QPSK 1_0	20525/836.5	1:1	0.144	0.14	22.08	22.50	1.102	0.159	22.2
Bottom side	10	QPSK 1_0	20525/836.5	1:1	0.001	-0.06	22.08	22.50	1.102	0.001	22.2
Extremity Test data(Separate 0mm 50%RB)											
Front side	10	QPSK 25_0	20525/836.5	1:1	0.001	-0.19	20.82	21.50	1.169	0.001	22.2
Back side	10	QPSK 25_0	20525/836.5	1:1	0.163	0.18	20.82	21.50	1.169	0.191	22.2
Left side	10	QPSK 25_0	20525/836.5	1:1	0.122	-0.14	20.82	21.50	1.169	0.143	22.2
Right side	10	QPSK 25_0	20525/836.5	1:1	0.153	0.18	20.82	21.50	1.169	0.179	22.2
Top side	10	QPSK 25_0	20525/836.5	1:1	0.139	0.03	20.82	21.50	1.169	0.163	22.2
Bottom side	10	QPSK 25_0	20525/836.5	1:1	0.001	0.02	20.82	21.50	1.169	0.001	22.2

Table 6： SAR of LTE Band 5 for Extremity.

9.2.3 SAR Result of LTE Band 7

LTE Band 7 SAR Test Record											
Main Ant.											
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Extremity Test data(Separate 0mm 1RB)											
Front side	20	QPSK 1_0	21100/2535	1:1	0.437	-0.11	23.84	24.00	1.038	0.453	22.3
Back side	20	QPSK 1_0	21100/2535	1:1	0.333	0.15	23.84	24.00	1.038	0.345	22.3
Left side	20	QPSK 1_0	21100/2535	1:1	0.684	0.07	23.84	24.00	1.038	0.710	22.3
Right side	20	QPSK 1_0	21100/2535	1:1	0.121	0.18	23.84	24.00	1.038	0.126	22.3
Top side	20	QPSK 1_0	21100/2535	1:1	3.180	0.06	23.84	24.00	1.038	3.299	22.3
Bottom side	20	QPSK 1_0	21100/2535	1:1	0.050	-0.02	23.84	24.00	1.038	0.052	22.3
Top side	20	QPSK 1_0	20850/2510	1:1	3.590	-0.09	23.77	24.00	1.054	3.785	22.3
Top side	20	QPSK 1_0	21350/2560	1:1	2.970	0.02	23.82	24.00	1.042	3.096	22.3
Extremity Test data(Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	21100/2535	1:1	0.422	0.05	22.78	23.00	1.052	0.444	22.3
Back side	20	QPSK 50_0	21100/2535	1:1	0.321	-0.07	22.78	23.00	1.052	0.338	22.3
Left side	20	QPSK 50_0	21100/2535	1:1	0.667	-0.09	22.78	23.00	1.052	0.702	22.3
Right side	20	QPSK 50_0	21100/2535	1:1	0.113	-0.08	22.78	23.00	1.052	0.119	22.3
Top side	20	QPSK 50_0	21100/2535	1:1	2.660	-0.15	22.78	23.00	1.052	2.798	22.3
Bottom side	20	QPSK 50_0	21100/2535	1:1	0.042	0.04	22.78	23.00	1.052	0.044	22.3
Top side	20	QPSK 50_0	20850/2510	1:1	3.030	0.02	22.77	23.00	1.054	3.195	22.3
Top side	20	QPSK 50_0	21350/2560	1:1	2.390	0.18	22.69	23.00	1.074	2.567	22.3
Extremity Test data(Separate 0mm 100%RB)											
Top side	20	QPSK 100_0	20850/2510	1:1	3.080	0.03	22.22	23.00	1.197	3.686	22.3
Extremity Test data(Separate 0mm 1RB) Repeat test											
Top side	20	QPSK 1_0	20850/2510	1:1	3.420	-0.03	23.77	24.00	1.054	3.605	22.3

Table 7： SAR of LTE Band 7 for Extremity.

9.2.4 SAR Result of LTE Band 66

LTE Band 66 SAR Test Record											
Main Ant.											
Test position	BW.	Test mode	Test ch./Freq.	Duty Cycle	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Extremity Test data(Separate 0mm 1RB)											
Front side	20	QPSK 1_0	132322/1745	1:1	0.138	0.01	23.47	24.00	1.130	0.156	21.9
Back side	20	QPSK 1_0	132322/1745	1:1	0.508	0.16	23.47	24.00	1.130	0.574	21.9
Left side	20	QPSK 1_0	132322/1745	1:1	0.380	0.16	23.47	24.00	1.130	0.429	21.9
Right side	20	QPSK 1_0	132322/1745	1:1	0.522	-0.07	23.47	24.00	1.130	0.590	21.9
Top side	20	QPSK 1_0	132322/1745	1:1	1.650	-0.06	23.47	24.00	1.130	1.864	21.9
Bottom side	20	QPSK 1_0	132322/1745	1:1	0.215	0.02	23.47	24.00	1.130	0.243	21.9
Extremity Test data(Separate 0mm 50%RB)											
Front side	20	QPSK 50_0	132322/1745	1:1	0.128	0.16	22.62	23.00	1.091	0.140	21.9
Back side	20	QPSK 50_0	132322/1745	1:1	0.470	-0.18	22.62	23.00	1.091	0.513	21.9
Left side	20	QPSK 50_0	132322/1745	1:1	0.467	-0.08	22.62	23.00	1.091	0.510	21.9
Right side	20	QPSK 50_0	132322/1745	1:1	0.494	-0.15	22.62	23.00	1.091	0.539	21.9
Top side	20	QPSK 50_0	132322/1745	1:1	1.440	-0.06	22.62	23.00	1.091	1.572	21.9
Bottom side	20	QPSK 50_0	132322/1745	1:1	0.196	0.12	22.62	23.00	1.091	0.214	21.9

Table 8： SAR of LTE Band 66 for Extremity.

9.2.5 SAR Result of WIFI 2.4G

Wi-Fi 2.4G SAR Test Record											
Main Ant.											
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Liquid Temp.(℃)
Extremity Test data(Separate 0mm)											
Front side	802.11b	6/2437	99.92%	1.001	0.001	0.05	10.69	11.00	1.074	0.001	22.2
Back side	802.11b	6/2437	99.92%	1.001	0.000	0.00	10.69	11.00	1.074	0.000	22.2
Left side	802.11b	6/2437	99.92%	1.001	0.001	0.01	10.69	11.00	1.074	0.001	22.2
Right side	802.11b	6/2437	99.92%	1.001	0.001	0.03	10.69	11.00	1.074	0.001	22.2
Top side	802.11b	6/2437	99.92%	1.001	0.000	0.00	10.69	11.00	1.074	0.000	22.2
Bottom side	802.11b	6/2437	99.92%	1.001	0.002	-0.09	10.69	11.00	1.074	0.002	22.2

Table 9： SAR of WIFI 2.4G for Extremity.

Note: When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.

9.3 Multiple Transmitter Evaluation

9.3.1 Simultaneous SAR test evaluation

- **Simultaneous Transmission Possibilities**

NO	Simultaneous Tx Combination	Extremity
1	WWAN + WIFI2.4G	Y

Note:

1) Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required it wireless router 1g SAR(Scaled to the maximum output power ,including tolerance) ＜ 1.2 W/Kg. Therefore, no further analysis beyond tables included in this section was required to determine that possible Simultaneous transmission scenarios would not exceed the SAR limit.

9.3.2 Simultaneous Transmission SAR Summation Scenario

Simultaneous Transmission SAR Summation Scenario for WLAN Extremity:

Extremity:

Test position		SAR max (W/kg)		Summed SAR
		Main Ant0	WiFi 2.4G Ant6(chain0)	
		1	2	1+2
LTE B2	Front side	0.171	0.001	0.172
	Back side	0.718	0.000	0.718
	Left side	0.300	0.001	0.301
	Right side	0.194	0.001	0.195
	Top side	2.781	0.000	2.781
	Bottom side	0.247	0.002	0.249
LTE B5	Front side	0.001	0.001	0.002
	Back side	0.193	0.000	0.193
	Left side	0.143	0.001	0.144
	Right side	0.182	0.001	0.183
	Top side	0.163	0.000	0.163
	Bottom side	0.001	0.002	0.003
LTE B7	Front side	0.453	0.001	0.454
	Back side	0.345	0.000	0.345
	Left side	0.710	0.001	0.711
	Right side	0.126	0.001	0.127
	Top side	3.785	0.000	3.785
	Bottom side	0.052	0.002	0.054
LTE B66	Front side	0.156	0.001	0.157
	Back side	0.574	0.000	0.574
	Left side	0.510	0.001	0.511
	Right side	0.590	0.001	0.591
	Top side	1.864	0.000	1.864
	Bottom side	0.243	0.002	0.245

10 Equipment list

Test Platform	SPEAG DASY5 Professional					
Description	SAR Test System (Frequency range 4MHz-7.25GHz)					
Software Reference	DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)					
Hardware Reference						
	Equipment	Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	Twin Phantom	SPEAG	SAM8	1824	NCR	NCR
☒	DAE	SPEAG	DAE4	1484	2024-10-15	2025-10-14
☒	E-Field Probe	SPEAG	EX3DV4	3982	2024-04-29	2025-04-28
☒	Validation Kits	SPEAG	D835V2	4d161	2023-08-25	2026-08-24
☒	Validation Kits	SPEAG	D1750V2	1038	2021-12-16	2024-12-15
☒	Validation Kits	SPEAG	D1950V3	1218	2023-05-04	2026-05-03
☒	Validation Kits	SPEAG	D2450V2	922	2023-08-28	2026-08-27
☒	Validation Kits	SPEAG	D2600V2	1187	2022-02-03	2025-02-02
☒	Agilent Network Analyzer	Agilent	E5071C	103535	2024-02-04	2025-02-03
☒	Universal Radio Communication Tester	R&S	CMW500	111637	2024-09-12	2025-09-11
☒	DAKS-3.5 probes	SPEAG	DAKS-3.5	1122	NA	NA
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	R&S	SMB100A	182393	2024-02-05	2025-02-04
☒	Preamplifier	Qiji	YX28980933	202104001	NCR	NCR
☒	Power Sensor	Keysight	U2002H	121251	2024-09-12	2025-09-11
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR
☒	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
☒	DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR
☒	Speed reading thermometer	LKM	DTM3000	NA	2024-09-13	2025-09-12
☒	Humidity and Temperature Indicator	Anymetre	Anymetre 1964	NA	2024-02-18	2025-02-17

Note: All the equipments are within the valid period when the tests are performed.

11 Calibration certificate

Please see the Appendix C

12 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

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